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Published in:
Health Psychology

DOI:
[10.1037/a0019878](https://doi.org/10.1037/a0019878)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2010

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Schokker, M. C., Keers, J. C., Bouma, J., Links, T. P., Sanderman, R., Wolffenbuttel, B. H. R., & Hagedoorn, M. (2010). The Impact of Social Comparison Information on Motivation in Patients With Diabetes as a Function of Regulatory Focus and Self-Efficacy. *Health Psychology, 29*(4), 438-445. <https://doi.org/10.1037/a0019878>

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The Impact of Social Comparison Information on Motivation in Patients With Diabetes as a Function of Regulatory Focus and Self-Efficacy

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Objective: Our aim was to determine whether the impact of upward and downward social comparison information on individuals' motivation to manage their diabetes is dependent on their regulatory focus (promotion or prevention focus) and self-efficacy. **Design:** The hypotheses were examined in a cross-sectional study. Patients with diabetes ($N = 234$) read a fictitious interview with a fellow patient, either an upward or a downward target, and they filled out questionnaires. **Main Outcome Measures:** Motivation to work on diabetes regulation. **Results:** High promotion-focused patients reported more motivation than low promotion-focused patients when confronted with the upward target (positive role model). High prevention-focused patients reported more motivation than low prevention-focused patients when confronted with the downward target (negative role model). This latter finding was qualified by patients' self-efficacy, as it applied only to patients with relatively high levels of self-efficacy. **Conclusion:** The current study highlights the importance of considering individual differences when using role models to encourage self-care activities in persons with diabetes.

Keywords: regulatory fit, social comparison, intention, chronic illness

Patients with diabetes need to adhere to a range of self-care behaviors to reduce the risk of developing serious disease complications (Diabetes Control and Complications Trial Research Group, 1993; Lawson, Gerstein, Tsui, & Zinman, 1999; U.K. Prospective Diabetes Study Group, 1998, 2000). Therefore, it is important that patients are motivated to carry out self-care behaviors, despite the potentially burdensome nature of these behaviors. Motivated patients are more likely to show desirable behavior changes. For example, individuals with low levels of motivation are less likely to engage in exercise than individuals with high levels of motivation (e.g., Courneya & Friedenreich, 1999). In the current study, we will use insights from the social comparison theory to explain individuals' motivation to manage their diabetes.

Social comparison consists of upward and downward comparisons. Upward comparison refers to comparing oneself with others who are doing better, whereas downward comparison refers to comparing oneself with others who are doing worse. Traditionally, it has been proposed that upward comparisons inspire and motivate

individuals (Taylor & Lobel, 1989), for example, in the context of dealing with a chronic illness. Upward comparison targets may provide individuals with useful information for self-improvement (e.g., Blanton, Buunk, Gibbons, & Kuyper, 1999; Buunk, Peiro, & Griffioen, 2007; Lockwood & Kunda, 1997). Research in the context of academic performance and health, however, suggests that not only upward, but also downward comparison information may motivate and inspire individuals. This research has identified regulatory focus as an individual characteristic that may determine whether upward and downward social comparison information is inspiring (Lockwood, Chasteen, & Wong, 2005; Lockwood, Jordan, & Kunda, 2002; Lockwood, Marshall, & Sadler, 2005; Lockwood, Sadler, Fyman, & Tuck, 2004; for an overview, see Lockwood & Pinkus, 2008).

Regulatory focus (Higgins, 1997, 1998; Lockwood et al., 2002) consists of two self-regulatory systems: self-regulation with a promotion focus and self-regulation with a prevention focus. A promotion focus refers to the extent to which one is focused on obtaining positive outcomes, whereas a prevention focus refers to the extent to which one is focused on avoiding negative outcomes. Studies have found that promotion-focused individuals are inspired by upward social comparison information, whereas prevention-focused individuals are inspired by downward social comparison information (e.g., Lockwood, Marshall, & Sadler, 2005; Lockwood et al., 2002; for an overview, see Lockwood & Pinkus, 2008). These studies have suggested that individuals will be most motivated to study or improve their health when the social comparisons match their regulatory focus. Specifically, upward comparison targets may activate an ideal possible future self (Markus & Nurius, 1986) and therefore function as a positive role model. Promotion-focused individuals who are oriented to obtain positive outcomes will be motivated by such positive role models,

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especially if these highlight not only positive outcomes, but also strategies to obtain these outcomes. On the contrary, a downward comparison target may activate a feared possible future self (Markus & Nurius, 1986) and therefore function as a negative role model. Prevention-focused individuals who are oriented toward avoiding negative outcomes will be motivated by such negative role models, especially if these highlight not only negative outcomes, but also strategies to avoid these outcomes.

A first aim of the current study was to examine whether the findings highlighted above can be generalized to a clinical sample of patients with diabetes. In most of the studies by Lockwood and colleagues (Lockwood, Jordan, & Kunda, 2002; Lockwood, Marshall, & Sadler, 2005; Lockwood, Sadler, Fyman, & Tuck, 2004), student samples were used to test the hypotheses; only one study included older individuals (Lockwood, Chasteen, & Wong, 2005). Furthermore, this older sample consisted of community-dwelling individuals who rated their own health positively. To the best of our knowledge, the question of whether the impact of social comparison information depends on regulatory focus has never been investigated in a clinical sample. This is surprising for two reasons. First, although a lack of motivation to engage in certain (health) behaviors may have serious consequences for healthy individuals, the risk is even higher for individuals with a chronic illness such as diabetes. Compared to healthy individuals, people with diabetes have an increased risk of developing cardiovascular diseases and other comorbidities; therefore, a lack of motivation may have more detrimental effects on these individuals. Second, it has been documented that during interviews, patients spontaneously compared themselves to other patients (Gorawara-Bhat, Huang, & Chin, 2008; Wood, Taylor, & Lichtman, 1985), which implies that social comparisons are central to patients' experiences. Due to these observations, we deemed it important to examine the impact of social comparison information and regulatory focus in a clinical sample of individuals with diabetes. In line with the findings of Lockwood and colleagues (e.g., Lockwood, Chasteen, & Wong, 2005; Lockwood, Jordan, & Kunda, 2002), we formulated the following hypotheses:

Hypothesis 1: A promotion focus will be positively associated with motivation to manage the diabetes, but only in patients presented with a positive role model.

Hypothesis 2: A prevention focus will be positively associated with motivation to manage the diabetes, but only in patients presented with a negative role model.

A second aim was to extend these hypotheses by investigating patients' self-efficacy as a second moderator. We postulate that our hypotheses will apply more strongly to patients who have high levels of self-efficacy. Previous research has identified perceived control as an important variable that may determine the impact of role models (for overviews, see Aspinwall, 1997; Wood & Van der Zee, 1997). It was found that individuals who were exposed to positive role models showed less persistence on a task when they felt they had little control over their ability to obtain positive outcomes (Testa & Major, 1990). Similarly, it can be expected that individuals exposed to negative role models will show less persis-

tence and motivation when they have little control over their ability to avert negative outcomes. We propose that promotion-focused patients will be even more motivated by positive role models if they experience high levels of self-efficacy related to managing their diabetes. Patients who feel capable of managing their disease will feel that they are able to obtain a similar future represented by the positive role model. Likewise, prevention-focused patients will be even more motivated by negative role models if they experience high levels of self-efficacy related to managing their diabetes. These patients will feel capable of avoiding a similar future represented by the negative role model (for a similar line of reasoning, see Lockwood, 2002). This moderating effect of self-efficacy has not yet been investigated in the context of role models and regulatory focus.

We formulated two additional hypotheses:

Hypothesis 3: A promotion focus will be positively associated with motivation to manage the diabetes, but only in patients presented with a positive role model. This will apply more strongly to patients who feel self-efficacious about managing their diabetes.

Hypothesis 4: A prevention focus will be positively associated with motivation to manage the diabetes, but only in patients presented with a negative role model. This will apply more strongly to patients who feel self-efficacious about managing their diabetes.

Method

Sample and Procedure

Data consist of the third assessment from a longitudinal study investigating adaptation to diabetes (Schokker et al., 2010). Approximately 690 eligible patients with Type 1 and 2 diabetes requiring insulin were approached to complete a short screening questionnaire. Patients with high levels of distress were offered a referral to a diabetes self-management intervention that has been described earlier (Keers et al., 2004). Inclusion criteria were: age 18 to 70 years, no severe comorbidity such as a clinical depression or a psychiatric disorder, not pregnant, and Dutch speaking. After patients had filled out the short questionnaire they were sent four larger questionnaires (Time 1 [T1] to T4); approximately 3 to 4 months separated the administration of the first three questionnaires, and approximately 5 to 6 months separated the third and fourth questionnaire. Eight of the 507 patients that filled out the initial short questionnaire did not receive follow-up questionnaires due to logistic problems. Of the 499 patients who did receive the T1 questionnaire, we excluded 33 patients because they accepted a referral to participate in the intervention program. Of the 466 patients who received the T1 questionnaire and were included in the present study, 234 patients (50.2%) filled out the T3 questionnaire, which assessed several additional constructs (e.g., general distress and partner support).

Manipulation of Social Comparison

We made use of an experimental manipulation, namely, one version of the T3 questionnaire contained a description of a

positive role model (upward social comparison information), whereas the other version contained a description of a negative role model (downward social comparison information). Patients were randomly assigned to one of these versions. They were instructed to carefully read a fragment from an interview with a person with diabetes and to answer questions about the interview afterward. The interview was printed realistically as a ripped-out section from a newspaper article. Both role model conditions did not state gender and age to make sure all participants could identify with the role models. The positive role model interview read as follows:

... my doctor. When I was told I had diabetes, I was very frightened. Controlling my diabetes did not go very well in the initial period, but I'm doing much better nowadays. I have succeeded in adjusting my life to the diabetes. Every day I cycle to my work, and I exercise twice a week, which has a beneficial effect on my blood sugar levels. My diet is also properly adjusted to the diabetes. I eat much healthier and I have lowered my fat consumption. I eat many more vegetables and fruit now. In the beginning I found it difficult to take into account that I had to inject insulin, but now I am used to it. I think I handle my diabetes very well, especially because I know a lot about diabetes and because I engage in healthy behaviors. My blood sugar levels have been quite stable and low for years now, and I still don't suffer from any complications. According to my doctor, I should be able to maintain good health if I keep up the good work.

The negative role model interview was as closely mirrored as possible to the positive role model interview, and read as follows:

... my doctor. When I was told I had diabetes, I was very frightened. Controlling my diabetes did not go very well in the initial period, and it is still not going well. I have not succeeded in adjusting my life to the diabetes. I intended to cycle to my work every day, and I should exercise twice a week, because this would have a beneficial effect on my blood sugar levels. However, I have not put these intentions into practice yet. My diet is also not properly adjusted to the diabetes. I love snack food and I am not so crazy about vegetables and fruit. I still find it difficult to take into account that I need to inject insulin; I can't get used to it. I don't think I handle my diabetes well, because of my insufficient knowledge of diabetes, and because I engage in unhealthy behaviors. My blood sugar levels have been too high for years now, and I am beginning to develop some complications. According to my doctor, there is a very high chance that my health will deteriorate if I do not change my lifestyle.

Instruments

Regulatory focus. The T3 questionnaire included a measure of regulatory focus (Lockwood et al., 2002), Dutch translation by Van Stekelenburg and Klandermans (2003), which consists of two subscales measuring promotion and prevention focus. Both subscales contain nine items and each item response ranges from 0 (*totally disagree*) to 7 (*totally agree*). A few adjustments were made, as some of the items from the original questionnaire focused on an academic domain and were therefore not relevant to our sample. More specifically, for the items in which the original questionnaire referred to academic goals and ambitions, we removed the word *academic*. Examples of promotion items include "I frequently imagine how I will achieve my hopes and aspirations," and "In general, I am focused on achieving positive outcomes in my life" ($M = 3.83$, $SD = 1.32$, Cronbach's $\alpha = .87$).

Examples of prevention items include "I am anxious that I will fall short of my responsibilities and obligations," and "I often imagine myself experiencing bad things that I fear might happen to me" ($M = 3.20$, $SD = 1.28$, Cronbach's $\alpha = .82$). The promotion and prevention focus subscale were positively correlated ($r = .54$, $p < .001$), indicating that a stronger promotion focus is associated with a stronger prevention focus (for a similar finding, see Schokker, Links, Luttik, & Hagedoorn, 2010).

Self-efficacy in diabetes management. We used a subscale of the Diabetes Empowerment Scale (Anderson, Funnell, Fitzgerald, & Marrero, 2000), which measures self-efficacy in diabetes management. The subscale we used specifically refers to the patients' self-efficacy in managing their diabetes by setting and achieving diabetes-specific goals. The subscale consists of 10 items and each item response ranges from 1 (*totally agree*) to 5 (*totally disagree*). We recoded the items in such a way that a higher score indicates a higher level of self-efficacy. Examples of items include "In general, I believe I can reach my diabetes goals once I make up my mind," and "In general, I believe that I am able to decide which way of overcoming barriers to my diabetes goals works best for me" ($M = 3.72$, $SD = 0.59$, Cronbach's $\alpha = .94$).

Motivation to work on diabetes regulation. After patients had read the bogus interview, they were asked, "To what extent does the interview motivate you to work on your diabetes regulation?" Patients rated this item on a 5-point scale ranging from 1 (*the interview does not motivate me at all*) to 5 (*I am very much motivated by the interview*), $M = 2.44$, $SD = 1.16$.

Manipulation check. Finally, patients completed a manipulation check item in which they rated their own diabetes management relative to that of the target. Ratings were made on a 5-point scale ranging from 1 (*my own diabetes management is much worse*) to 5 (*my own diabetes management is much better*), $M = 3.59$, $SD = 1.18$.

Results

Descriptives

The questionnaire containing the upward comparison information was filled out by 113 patients and the questionnaire containing the downward comparison information was completed by 121 patients. Overall, 50.9% were men. The average age of the participants was 54.5 years ($SD = 11.60$) and the average diabetes duration was 16.7 years ($SD = 11.60$). Mean HbA1c value, which reflects patients' glycemic control, was 7.2 ($SD = 0.92$; normal values 4 to 6%, target value $< 7\%$). The majority of the patients were married (71.8%), 6.4% were living together with a partner, 2.1% reported having a partner, but not living together, 19.6% did not have a partner. There were no significant differences between patients in the upward and the downward condition on any of the descriptive variables.

We also examined whether promotion and prevention focus, in addition to self-efficacy in diabetes management were related to any of the descriptive variables. There was a weak positive association between promotion focus and self-efficacy ($r = .14$, $p = .04$), and a weak negative association between promotion focus and age ($r = -.14$, $p = .03$). In addition, there was a weak negative association between self-efficacy and HbA1c level ($r = -.13$, $p = .05$). No other significant associations were found.

Manipulation Check

To see whether our manipulation was successful, we examined the mean ratings on the manipulation check item. A score of three on the manipulation check item indicates that patients perceive their own diabetes management as equally good. The results showed that mean ratings in both conditions were significantly different from three, $t(112) = -2.76, p < .01$, and $t(120) = 18.93, p < .001$, for the positive and negative role model condition, respectively. These results indicate that patients felt inferior to the positive role model and superior to the negative role model.

In addition, we examined whether the positive role model was perceived as doing better, and the negative role model as doing worse by patients with different levels of promotion and prevention focus, as well as different levels of self-efficacy in diabetes management. We performed a hierarchical regression analysis using direction of social comparison (the positive role model coded as +1 and the negative role model as -1), promotion and prevention focus, and self-efficacy as predictors of the manipulation check. To avoid multicollinearity between the predictors and the interaction terms, we centered the scores on the continuous predictors (Aiken & West, 1991). In subsequent steps, we entered into the regression equation the main effects (Step 1), all two-way interactions (Step 2), and the three-way interactions between direction of social comparison, regulatory focus (either promotion or prevention focus), and self-efficacy (Step 3). In general, patients perceived their own diabetes management as relatively worse in comparison to the positive role model than in comparison to the negative role model ($M = 2.76, SD = 0.92$ vs. $M = 4.36, SD = 0.80$, respectively, $B = -0.81, p < .001$). There were also main effects of promotion focus ($B = 0.11, p = .05$) and prevention focus ($B = -0.13, p = .02$). These main effects indicated that with stronger levels of promotion focus, one's own diabetes management was perceived as better, whereas with stronger levels of prevention focus, one's own diabetes management was perceived as worse. The main effect of self-efficacy was not significant ($B = 0.20, p = .06$). All two-way interactions and the three-way interactions were not significant (all $ps > .06$). This suggests that regardless of the level of promotion and prevention focus and self-efficacy in diabetes management, patients perceived the positive role model as doing better and the negative role model as doing worse in comparison to themselves.

Testing the Hypotheses

Hierarchical regression analyses were performed to examine the effects of direction of social comparison (positive vs. negative role model); regulatory focus (promotion and prevention focus); self-efficacy in diabetes management; and the interactions on motivation to work on diabetes regulation.¹

The results (see Table 1) revealed a main effect of prevention focus, namely that a stronger prevention focus was associated with more motivation. No main effects of direction of social comparison, promotion focus, or self-efficacy were found. As expected, there was a significant two-way interaction between promotion focus and direction of social comparison. To probe this two-way interaction we calculated and plotted the regression slopes for patients confronted with the positive and the negative role model, at the average level of prevention focus (see Figure 1). A promo-

tion focus was associated with more motivation in patients confronted with the positive role model ($B = 0.27, p = .01$), but not in patients confronted with the negative role model ($B = -0.04, p = .63$). The three-way interaction among direction of social comparison, promotion focus, and self-efficacy was not significant.

The hypothesized interaction between prevention focus and direction of social comparison was also significant. A prevention focus was associated with more motivation in patients confronted with the negative role model ($B = 0.38, p < .001$), but not in patients confronted with the positive role model ($B = -0.12, p = .22$). This two-way interaction was qualified by a three-way interaction. We further explored this three-way interaction by investigating the two-way interactive effect of direction of social comparison and prevention focus on the motivation of patients with relatively low self-efficacy and of patients with relatively high self-efficacy, separately (+1 *SD* for high and -1 *SD* for low self-efficacy). Among patients with relatively low self-efficacy, the two-way interaction between direction of social comparison and prevention focus was not significant ($B = -0.10, p = .29$). Furthermore, the slopes for the negative and positive role model were both nonsignificant ($B = 0.24, p = .09$, and $B = 0.03, p = .82$, respectively, see Figure 2A). As predicted, among patients with relatively high self-efficacy, there was a significant two-way interaction between direction of social comparison and prevention focus ($B = -0.38, p < .001$). In these patients with relatively high self-efficacy, prevention focus was positively associated with motivation when patients had read the negative role model ($B = 0.52, p < .001$), but not when patients had read the positive role model ($B = -0.24, p = .06$; see Figure 2B).

Discussion

In this clinical sample of patients with diabetes, motivation to manage the disease is an important outcome. Patients who are motivated are more likely to carry out self-care activities that may eventually prevent or postpone disease complications. Our first two hypotheses are consistent with these findings. Patients with a relatively strong promotion focus were motivated by the positive role model, which highlighted strategies to obtain positive outcomes. Conversely, patients with a relatively strong prevention focus were motivated by the negative role model, which highlighted strategies to avoid negative outcomes.

Our third hypothesis was not confirmed; the interaction between promotion focus and direction of social comparison was not qualified by self-efficacy. A possible explanation may be that overall, patients with a strong promotion focus had high levels of self-efficacy, and that a ceiling effect occurred. This explanation does not hold however, because self-efficacy and promotion focus were not significantly correlated ($r = .08, p = .21$; self-efficacy and prevention focus were only weakly correlated: $r = .13, p = .04$).

¹ We also ran an analysis in which we included the three-way interaction of promotion focus, prevention focus, and goal self-efficacy, the three-way interaction of promotion focus, prevention focus, and direction of social comparison, and the four-way interaction of promotion focus, prevention focus, goal self-efficacy, and direction of social comparison. Because both interactions were not significant and because they were not of main interest in our study, we excluded these interactions in our final analysis.

Table 1

Results of the Regression of Motivation to Work on Diabetes Regulation on Direction of Social Comparison, Regulatory Focus, and Self-Efficacy in Diabetes Management

Variables/Interactions	Motivation				
	<i>B</i>	<i>SE</i>	ΔR^2	ΔF	<i>p</i>
Step 1			.06	3.77	<.01
Direction of social comparison ^a	-0.04	0.08			.63
Promotion focus	0.10	0.07			.18
Prevention focus	0.14	0.07			.05
Self-efficacy in diabetes management	0.01	0.14			.97
Step 2			.06	2.64	.02
Prevention Focus \times Promotion Focus	<0.01	0.04			.95
Prevention Focus \times Self-Efficacy in Diabetes Management	<0.01	0.11			.96
Promotion Focus \times Self-Efficacy in Diabetes Management	-0.11	0.10			.28
Direction \times Self-Efficacy in Diabetes Management	-0.16	0.14			.24
Direction \times Promotion Focus	0.14	0.07			.04
Direction \times Prevention Focus	-0.24	0.07			<.01
Step 3			.03	3.38	.04
Direction \times Promotion Focus \times Self-Efficacy in Diabetes Management	-0.02	0.10			.87
Direction \times Prevention Focus \times Self-Efficacy in Diabetes Management	-0.24	0.11			.02

^a Direction of social comparison: -1 = negative role model; +1 = positive role model.

The fact that self-efficacy did not moderate the findings with regard to promotion focus appears to suggest that having a strong promotion focus is sufficient to boost patients' motivation when they encounter a positive role model.

The results did confirm our fourth hypothesis. Prevention focus was positively associated with motivation in patients who were confronted with the negative role model, but only when these patients had relatively high levels of self-efficacy in managing diabetes by setting and achieving diabetes-specific goals.

Our results contribute to the existing literature in two important ways. First, our results indicate that previous findings regarding regulatory focus and social comparison in healthy populations (e.g., Lockwood et al., 2002), can be generalized to a clinical sample. Managing a chronic illness such as diabetes may help patients maintain good health and prevent or postpone complications. Thus, it is highly important that patients are motivated to engage in healthy behaviors and avoid unhealthy ones. Our findings demonstrate that motivation may be enhanced when patients

are confronted with role models that are congruent with patients' regulatory focus.

Second, our findings contribute to the existing literature on regulatory focus and social comparison by showing that self-efficacy qualified the interaction between prevention focus and direction of social comparison. In a study that demonstrated that students were most motivated by a negative role model when they felt vulnerable to the fate of this role model, it was speculated that perceived control (cf. self-efficacy) may also be important in determining whether negative role models boost one's motivation (Lockwood, 2002). As far as we know, our study is the first to test the hypothesis that regulatory focus will moderate the effects of role models only when feelings of self-efficacy are high. Our findings are in line with the reasoning that only patients with a strong prevention focus who believe they can avoid the feared self represented by the negative role model will be motivated by this model. Patients who have a strong prevention focus but who do not believe they can avoid this feared self, will not be motivated by the negative role model.

The results of the manipulation check item showed that the positive role model was indeed viewed as upward, and the negative role model as downward. This is not a self-evident result because individuals tend to perceive positive role models as similar to themselves, rather than superior (Collins, 2000). However, additional analyses showed that the manipulation of the negative role model was stronger than the manipulation of the positive role model. Ratings on the manipulation check item were farther from the neutral midpoint of the scale (the point at which patients perceived their own diabetes management as equally good) for the negative role model than for the positive role model, $t(232) = 10.09$, $p < .001$. This may indicate that the interaction effect of promotion focus and the positive role model would be even more pronounced with a stronger manipulation of the positive role model.

The description of the role models contained information on behaviors the targets engaged in, as well as outcomes they expe-

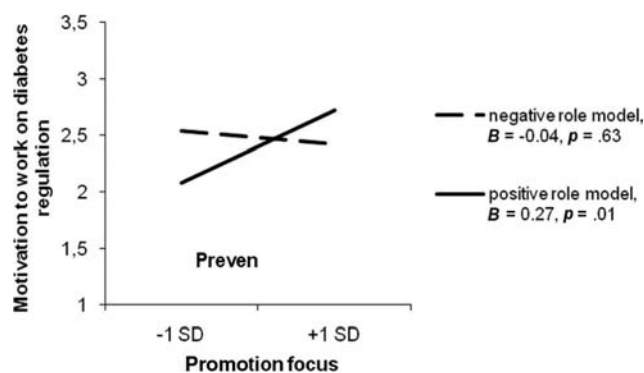


Figure 1. The interactive effect of direction of social comparison and promotion focus on motivation, at an average level of prevention focus.

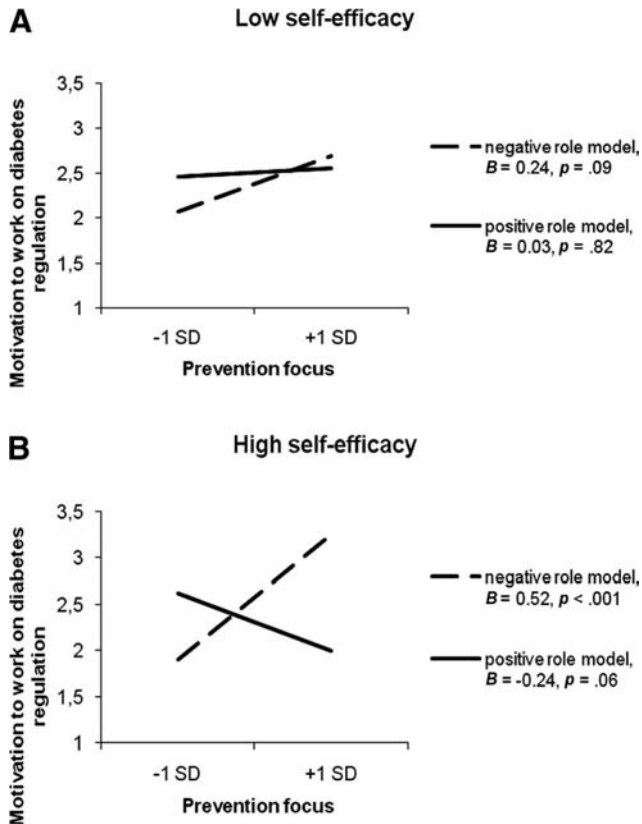


Figure 2. A: The interactive effect of direction of social comparison and prevention focus on motivation, of patients with a relatively low self-efficacy in diabetes management, at an average level of promotion focus. B: The interactive effect of direction of social comparison and prevention focus on motivation, of patients with a relatively high self-efficacy in diabetes management, at an average level of promotion focus.

rienced. Perhaps the same results would be obtained if the role models contained information on only the outcomes. However, a previous study among teachers (Van Yperen, Brenninkmeijer, & Buunk, 2006) demonstrated that role models may increase intention to work harder, but only when the success of the positive role model is explained in terms of high effort, and the failure of the negative role model in terms of low effort. It is therefore also plausible that in our study, information on behaviors that explain how to achieve or avoid the outcomes experienced by the role models was necessary to boost motivation.

The interview fragments in the current study were as closely mirrored as possible to enhance the consistency between the two conditions, which can be considered as a strength. However, as a consequence the negative role model largely referred to the absence of health-promoting behaviors rather than the presence of unhealthy behaviors (except for the snacking behavior). Prevention messages (i.e., a negative role model description) may thus be framed in different ways and future studies could more closely examine whether these different ways of framing have different effects on motivation.

Future studies should also focus on how role models can be adopted in clinical practice. For example, during intervention

programs, patients could be provided with examples of role models that fit their regulatory orientations. In addition, examples of role models could be provided during regular consultations with physicians. It would be interesting to examine whether the recurrent implementation of role models in practice could lead to enhanced motivation and actual behavior change in the long run. Related to this, future research could take into account different types of behavioral change. For individuals who are considering additive (promotion-focused) behaviors, such as eating more healthy foods, positive role models may be more stimulating. On the other hand, when individuals are considering subtractive (prevention-focused) behaviors, such as quitting smoking, negative role models may be more stimulating (Lockwood et al., 2004). Likewise, patients with diabetes may contemplate additive or subtractive behaviors (e.g., eating vegetables vs. avoiding eating fatty snacks), which may determine whether positive or negative role models are most effective.

A limitation of this study is that motivation was measured with only one item. However, we chose a more global measurement of motivation, because the salience of specific self-management behaviors that need to be carried out can differ from patient to patient. Furthermore, it should be noted that several studies showed that single-item measures can function well in comparison to multiple-item scales (e.g., Robins, Hendin, & Trzesniewski, 2001; Wanous, Reichers, & Hudy, 1997). A second limitation is that we do not know whether patients did indeed engage in social comparison. It could be argued that the effects of the positive and negative role model were not as much due to the direction of social comparison but rather to the positive or negative tone of the story (for a similar line of reasoning, see Buunk & Ybema, 2003). Similar results may be obtained when patients are confronted with merely positive or negative information, without referring to social comparison targets. Indeed, several studies of individuals without chronic illnesses have demonstrated similar effects of merely positive and negative information on intentions and behaviors. Individuals who were presented with information (positive or negative) that fit their regulatory focus (promotion or prevention focus) reported a stronger engagement in behaviors and showed enhanced performance (e.g., Latimer et al., 2008; Mann, Sherman, & Updegraff, 2004; Plessner, Unkelbach, Memmert, Baltes, & Kolb, 2009). It is common practice to present information to patients that purely focuses on positive and negative consequences of (not) adhering to self-management activities (e.g., "exercising regularly may improve glycemic control"). It would be interesting to see whether information referring to another patient with diabetes (e.g., "Because John is exercising regularly, his glycemic control has improved") would have a greater impact on motivation and behavior than information that does not refer to another patient. It could be argued that social comparison information may prove to be especially effective when trying to motivate patients. A previous study of patients with diabetes demonstrated that the majority did make social comparisons and that these patients were more likely to perform self-management behaviors than patients who did not engage in social comparison (Gorawara-Bhat et al., 2008). Nevertheless, individuals may differ in their tendency to make social comparisons (e.g., Gibbons & Buunk, 1999), and it is plausible that the provision of purely positive or negative information is more beneficial for individuals with a low social comparison orientation.

Although several factors need to be taken into account for future research, the current results suggest that individual differences in regulatory focus influence the motivating impact of positive and negative role models in patients with diabetes. Furthermore, prevention-focused patients may be most motivated when confronted with negative role models, but only when their level of self-efficacy is relatively high. Overall, it appears that when trying to motivate patients, a “one size fits all” approach is not sufficient.

References

- Aiken, L., & West, S. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Anderson, R. M., Funnell, M. M., Fitzgerald, J. T., & Marrero, D. G. (2000). The Diabetes Empowerment Scale: A measure of psychosocial self-efficacy. *Diabetes Care*, 23, 739–743.
- Aspinwall, L. (1997). Future-oriented aspects of social comparisons: A framework for studying health-related comparison activity. In B. Buunk (Ed.), *Health, coping, and well-being: Perspectives from social comparison theory* (pp. 125–165). Mahwah, NJ: Erlbaum.
- Blanton, H., Buunk, B. P., Gibbons, F. X., & Kuyper, H. (1999). When better-than-others compare upward: Choice of comparison and comparative evaluation as independent predictors of academic performance. *Journal of Personality and Social Psychology*, 76, 420–430.
- Buunk, A. P., Peiro, J. M., & Griffioen, C. (2007). A positive role model may stimulate career-oriented behavior. *Journal of Applied Social Psychology*, 37, 1489–1500.
- Buunk, B. P., & Ybema, J. (2003). Feeling bad, but satisfied: The effects of upward and downward comparison upon mood and marital satisfaction. *British Journal of Social Psychology*, 42, 613–628.
- Collins, R. L. (2000). Among the better ones: Upward assimilation in social comparison. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 159–171). Dordrecht, The Netherlands: Kluwer Academic.
- Courneya, K. S., & Friedenreich, C. M. (1999). Utility of the theory of planned behavior for understanding exercise during breast cancer treatment. *Psycho-Oncology*, 8, 112–122.
- Diabetes Control and Complications Trial Research Group. (1993). The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *New England Journal of Medicine*, 329, 977–986.
- Gibbons, F., & Buunk, B. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76, 129–142.
- Gorawara-Bhat, R., Huang, E. S., & Chin, M. H. (2008). Communicating with older diabetes patients: Self-management and social comparison. *Patient Education and Counseling*, 72, 411–417.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52, 1280–1300.
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology*, 30, 1–46.
- Keers, J. C., Blaauwwekel, E. E., Hania, M., Bouma, J., Scholten-Jaegers, S. M., Sanderma, R., . . . & Links, T. P. (2004). Diabetes rehabilitation: Development and first results of a multidisciplinary intensive education program for patients with prolonged self-management difficulties. *Patient Education and Counseling*, 52, 151–157.
- Latimer, A. E., Rivers, S. E., Rench, T. A., Katulak, N. A., Hicks, A., Hodorowski, J. K., . . . Salovey, P. (2008). A field experiment testing the utility of regulatory fit messages for promoting physical activity. *Journal of Experimental Social Psychology*, 44, 826–832.
- Lawson, M. L., Gerstein, H. C., Tsui, E., & Zinman, B. (1999). Effect of intensive therapy on early macrovascular disease in young individuals with type 1 diabetes—A systematic review and meta-analysis. *Diabetes Care*, 22, B35–B39.
- Lockwood, P. (2002). Could it happen to you? Predicting the impact of downward comparisons on the self. *Journal of Personality and Social Psychology*, 82, 343–358.
- Lockwood, P., Chasteen, A., & Wong, C. (2005). Age and regulatory focus determine preferences for health-related role models. *Psychology and Aging*, 20, 376–389.
- Lockwood, P., Jordan, C., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, 83, 854–864.
- Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology*, 73, 91–103.
- Lockwood, P., Marshall, T., & Sadler, P. (2005). Promoting success or preventing failure: Cultural differences in motivation by positive and negative role models. *Personality and Social Psychology Bulletin*, 31, 379–392.
- Lockwood, P., & Pinkus, R. T. (2008). The impact of social comparisons on motivation. In J. Y. Shah & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 251–264). New York, NY: Guilford Press.
- Lockwood, P., Sadler, P., Fyman, K., & Tuck, S. (2004). To do or not to do: Using positive and negative role models to harness motivation. *Social Cognition*, 22, 422–450.
- Mann, T., Sherman, D., & Updegraff, J. (2004). Dispositional motivations and message framing: A test of the congruency hypothesis in college students. *Health Psychology*, 23, 330–334.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41, 954–969.
- Plessner, H., Unkelbach, C., Memmert, D., Baltes, A., & Kolb, A. (2009). Regulatory fit as a determinant of sport performance: How to succeed in a soccer penalty-shooting. *Psychology of Sport and Exercise*, 10, 108–115.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg self-esteem scale. *Personality and Social Psychology Bulletin*, 27, 151–161.
- Schokker, M. C., Links, T. P., Bouma, J., Keers, J. C., Sanderma, R., Wolffenbuttel, B. H. R., & Hagedoorn, M. (2010). The role of overprotection by the partner in coping with diabetes: A moderated mediation model. *Psychology & Health*. First published on: 18 February 2010 (iFirst). doi: 10.1080/08870440903342325
- Schokker, M. C., Links, T. P., Luttik, M., & Hagedoorn, M. (2010). The association between regulatory focus and distress in patients with a chronic disease: The moderating role of partner support. *British Journal of Health Psychology*, 15, 63–78.
- Taylor, S., & Lobel, M. (1989). Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review*, 96, 569–575.
- Testa, M., & Major, B. (1990). The impact of social comparisons after failure: The moderating effects of perceived control. *Basic and Applied Social Psychology*, 11, 205–218.
- U.K. Prospective Diabetes Study Group. (1998). Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet*, 352, 837–853.
- U.K. Prospective Diabetes Study Group. (2000). Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): Prospective observational study. *British Medical Journal*, 321, 405–412.
- Van Stekelenburg, J., & Klandermans, B. (2003). *Regulatory focus meten met behulp van spreekwoorden* [Using proverbs to measure regulatory focus]. Groningen, The Netherlands: Jaarboek Sociale Psychologie.
- Van Yperen, N. W., Brenninkmeijer, V., & Buunk, A. R. (2006). People's

- responses to upward and downward social comparisons: The role of the individual's effort-performance expectancy. *British Journal of Social Psychology*, 45, 519–533.
- Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology*, 82, 247–252.
- Wood, J. V., Taylor, S. E., & Lichtman, R. R. (1985). Social-comparison in adjustment to breast-cancer. *Journal of Personality and Social Psychology*, 49, 1169–1183.
- Wood, J. V., & Van der Zee, K. (1997). Social comparisons among cancer patients: Under what conditions are comparisons upward and downward? In B. Buunk (Ed.), *Health, coping, and well-being: Perspectives from social comparison theory* (pp. 299–328). Mahwah, NJ: Erlbaum. ■